What is claimed is:

1. A printed circuit board integrated with a two-axis fluxgate sensor, comprising:

a first soft magnetic core formed lengthwise in a first axial direction;

a first excitation coil formed of a metal film and wound around the first soft magnetic core;

a first pick-up coil formed of a metal film and wound around the first soft magnetic core and the first excitation coil;

a second soft magnetic core formed lengthwise in a second axial direction, the second axial direction being perpendicular to the first axial direction;

a second excitation coil formed of a metal film and wound around the second soft magnetic core;

a second pick-up coil formed of a metal film and wound around the second soft magnetic core and the second excitation coil; and

a pad for establishing conductivity between the first and second excitation coils and the first and second pick-up coils and an external circuit.

2. The printed circuit board as claimed in claim 1, wherein the first and second soft magnetic cores comprise two parallel bars on a same plane.

3. The printed circuit board as claimed in claim 2, wherein the first and second excitation coils have a structure of winding the two bars substantially in a solenoid pattern.

4. The printed circuit board as claimed in claim 3, wherein the first and second pick-up coils have a structure of winding the two bars together substantially in a solenoid pattern.

5. The printed circuit board as claimed in claim 4, wherein the first and second excitation coils and the first and second pick-up coils wind the two bars in an alternating fashion.

6. The printed circuit board as claimed in claim 5, wherein the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion, such that the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the two bars therebetween.

7. The printed circuit board as claimed in claim 3, wherein the first and second pick-up coils have a structure of winding the two bars substantially in a solenoid pattern.

8. The printed circuit board as claimed in claim 7, wherein the first and second excitation coils and the first and second pick-up coils wind the two bars in an alternating fashion.

9. The printed circuit board as claimed in claim 8, wherein the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion, such that the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the two bars therebetween.

10. The printed circuit board as claimed in claim 2, wherein the first and second excitation coils have a structure of winding the two bars alternately substantially in a figure-eight pattern.

11. The printed circuit board as claimed in claim 10, wherein the first and second pick-up coils have a structure of winding the two bars together substantially in a solenoid pattern.

12. The printed circuit board as claimed in claim 11, wherein the first and second excitation coils and the first and second pick-up coils have a structure of winding the two bars in an alternating fashion.

13. The printed circuit board as claimed in claim 12, wherein the first and second excitation coils and the first and second pick-up coils are

wound once substantially in a zigzag fashion, such that the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the two bars therebetween.

14. The printed circuit board as claimed in claim 10, wherein the first and second pick-up coils have a structure of winding the two bars substantially in a solenoid pattern.

15. The printed circuit board as claimed in claim 14, wherein the first and second excitation coils and the first and second pick-up coils have a structure of winding the two bars in an alternating fashion.

16. The printed circuit board as claimed in claim 15, wherein the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion, such that the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the two bars therebetween.

17. The printed circuit board as claimed in claim 1, wherein the first and second soft magnetic cores comprise a rectangular-ring formed on a same plane.

18. The printed circuit board as claimed in claim 17, wherein the first and second excitation coils have a structure of winding both sides of the rectangular-ring in an axial direction substantially in a solenoid pattern.

19. The printed circuit board as claimed in claim 18, wherein the first and second pick-up coils have a structure of winding both sides of the rectangular-ring in an axial direction together substantially in a solenoid pattern.

20. The printed circuit board as claimed in claim 19, wherein the first and second excitation coils and the first and second pick-up coils have a structure of winding the rectangular-ring in an alternating fashion.

21. The printed circuit board as claimed in claim 20, wherein the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion, such that the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the rectangular-ring therebetween.

22. The printed circuit board as claimed in claim 18, wherein the first and second pick-up coils have a structure of winding both sides of the rectangular-ring substantially in a solenoid pattern.

23. The printed circuit board as claimed in claim 22, wherein the first and second excitation coils and the first and second pick-up coils have a structure of winding the rectangular-ring in an alternating fashion.

24. The printed circuit board as claimed in claim 23, wherein the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion, such that the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the rectangular-ring therebetween.

25. The printed circuit board as claimed in claim 17, wherein the first and second excitation coils are wound around both sides of the rectangular-ring in an axial direction alternately substantially in a figure-eight pattern.

26. The printed circuit board as claimed in claim 25, wherein the first and second pick-up coils have a structure of winding both sides of the rectangular-ring in axial direction together substantially in a solenoid pattern.

27. The printed circuit board as claimed in claim 26, wherein the first and second excitation coils and the first and second pick-up coils have a structure of winding the rectangular-ring in an alternating fashion.

28. The printed circuit board as claimed in claim 27, wherein the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion, such that the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the rectangular-ring therebetween.

29. The printed circuit board as claimed in claim 25, wherein the first and second pick-up coils have a structure of winding both sides of the rectangular-ring in axial direction substantially in a solenoid pattern.

30. The printed circuit board as claimed in claim 29, wherein the first and second excitation coils and the first and second pick-up coils have a structure of winding the rectangular-ring in an alternating fashion.

31. The printed circuit board as claimed in claim 30, wherein the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion, such that the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the rectangular-ring therebetween.

32. A method for manufacturing a printed circuit board integrated with a two-axis fluxgate sensor, comprising:

(a) forming lower patterns of excitation coils and pick-up coils on both sides of a first substrate, wherein the first substrate is formed by stacking a metal film on both sides of a dielectric substance;

(b) sequentially stacking a prepreg and a soft magnetic substance film on each of the lower patterns of the excitation coils and the pick-up coils;

(c) forming soft magnetic cores on each of the soft magnetic substance films, the soft magnetic cores on the soft magnetic substance films being in perpendicular relation;

(d) forming a second substrate by sequentially stacking a prepreg and a metal film on each side of the soft magnetic cores;

(e) forming upper patterns of the excitation coils and the pick-up coils on each of the metal films stacked on both sides of the second substrate, each of the upper patterns corresponding to a respective one of the lower patterns that is formed at the same side as the respective one of the upper patterns;

(f) forming through holes from the upper patterns to the lower patterns formed on each of the metal films on both sides of the second substrate;

(g) plating both sides of the second substrate where the through holes are formed;

(h) etching the plated sides of the second substrate so that the excitation coils and the pick-up coils are separately formed on both sides with respective winding structures; and

(i) forming a pad for establishing conductivity between the excitation coils and the pick-up coils and an external circuit.

33. The manufacturing method as claimed in claim 32, wherein the soft magnetic cores formed on both sides of the second substrate comprise two parallel bars formed on a same plane.

34. The manufacturing method as claimed in claim 33, wherein the excitation coils have a structure of winding the two bars substantially in a solenoid pattern.

35. The manufacturing method as claimed in claim 34, wherein the pick-up coils have a structure of winding the two bars together substantially in a solenoid pattern.

36. The manufacturing method as claimed in claim 35, wherein the excitation coils and the pick-up coils wind the two bars in an alternating fashion.

37. The manufacturing method as claimed in claim 36, wherein the excitation coils and pick-up coils are wound once substantially in a zigzag fashion, such that the excitation coils and the pick-up coils face each other with the intervention of the two bars therebetween.

38. The manufacturing method as claimed in claim 34, wherein the pick-up coils have a structure of winding the two bars substantially in a solenoid pattern.

39. The manufacturing method as claimed in claim 38, wherein the excitation coils and the pick-up coils wind the two bars in an alternating fashion.

40. The manufacturing method as claimed in claim 39, wherein the excitation coils and pick-up coils are wound once substantially in a zigzag fashion, such that the excitation coils and the pick-up coils face each other with the intervention of the two bars therebetween.

41. The manufacturing method as claimed in claim 32, wherein the excitation coils have a structure of winding the two bar-type soft magnetic cores alternately and substantially in a figure-eight pattern.

42. The manufacturing method as claimed in claim 41, wherein the pick-up coils have a structure of winding the two bars together substantially in a solenoid pattern.

43. The manufacturing method as claimed in claim 42, wherein the excitation coils and the pick-up coils wind the two bars in an alternating fashion.

44. The manufacturing method as claimed in claim 43, wherein the excitation coils and pick-up coils are wound once substantially in a zigzag fashion, such that the excitation coils and the pick-up coils face each other with the intervention of the two bars therebetween.

45. The manufacturing method as claimed in claim 41, wherein the pick-up coils have a structure of winding the two bars substantially in a solenoid pattern.

46. The manufacturing method as claimed in claim 45, wherein the excitation coils and the pick-up coils have a structure of winding the two bars in an alternating fashion.

47. The manufacturing method as claimed in claim 46, wherein the excitation coils and pick-up coils wind the two bars in an alternating fashion.

48. The manufacturing method as claimed in claim 32, wherein the soft magnetic core comprises a rectangular-ring formed on a same plane.

49. The manufacturing method as claimed in claim 48, wherein the excitation coils have a structure of winding both sides of the rectangular-ring in an axial direction substantially in a solenoid pattern.

50. The manufacturing method as claimed in claim 49, wherein the pick-up coils have a structure of winding both sides of the rectangular-ring in an axial direction together substantially in a solenoid pattern.

51. The manufacturing method as claimed in claim 50, wherein the excitation coils and the pick-up coils have a structure of winding the rectangular-ring in an alternating fashion.

52. The manufacturing method as claimed in claim 51, wherein the excitation coils and pick-up coils are wound once substantially in a zigzag fashion, such that the excitation coils and the pick-up coils face each other with the intervention of the rectangular-ring therebetween.

53. The manufacturing method as claimed in claim 49, wherein the pick-up coils have a structure of winding both sides of the rectangular-ring substantially in a solenoid pattern.

54. The manufacturing method as claimed in claim 53, wherein the excitation coils and the pick-up coils have a structure of alternately winding the rectangular-ring in an alternating fashion.

55. The manufacturing method as claimed in claim 54, wherein the excitation coils and pick-up coils are wound once substantially in a zigzag fashion, such that the excitation coils and the pick-up coils face each other with the intervention of the rectangular-ring therebetween.

56. The manufacturing method as claimed in claim 32, wherein the excitation coils are alternately wound around both sides of the rectangular-ring in an axial direction substantially in figure-eight pattern.

57. The manufacturing method as claimed in claim 56, wherein the pick-up coils have a structure of winding both sides of the rectangular-ring in an axial direction together substantially in a solenoid pattern.

58. The manufacturing method as claimed in claim 57, wherein the excitation coils and the pick-up coils have a structure of winding the rectangular-ring in an alternating fashion.

59. The manufacturing method as claimed in claim 58, wherein the excitation coils and pick-up coils are wound once substantially in a zigzag fashion, such that the excitation coils and the pick-up coils face each other with the intervention of the rectangular-ring therebetween.

60. The manufacturing method as claimed in claim 56, wherein the pick-up coils have a structure of winding both sides of the rectangular-ring in an axial direction substantially in a solenoid pattern.

61. The manufacturing method as claimed in claim 60, wherein the excitation coils and the pick-up coils have a structure of winding the rectangular-ring in an alternating fashion.

62. The manufacturing method as claimed in claim 61, wherein the excitation coils and pick-up coils are wound once substantially in a zigzag fashion, such that the excitation coils and the pick-up coils face each other with the intervention of the rectangular-ring therebetween.

63. The manufacturing method as claimed in claim 32, wherein forming the upper pattern of the excitation coil and the pick-up coil corresponding to the lower pattern of the excitation coil and the pick-up coil further comprises:

etching the metal films stacked on both sides of the second substrate to a predetermined thickness.

64. The manufacturing method as claimed in claim 32, wherein each of (a) through (i) comprise:

applying a photosensitive agent on a predetermined surface;

light-exposing according to a predetermined shape; and

etching a predetermined location according to the light exposure.